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10/564,037	06/21/2006	Kaveh Niayesh	1004501-000832	5780

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EXAMINER
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HOANG, ANN THI

ART UNIT	PAPER NUMBER
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2836

NOTIFICATION DATE	DELIVERY MODE
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04/10/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/564,037	<b>Applicant(s)</b> NIAYESH ET AL.	
	<b>Examiner</b> ANN T. HOANG	<b>Art Unit</b> 2836	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 36-57 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 36-57 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 January 2006 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/27/09</u> . | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Specification***

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

2. Thus, it appears that the words "as claimed in the invention" in line 3 of the abstract should be omitted because this is a phrase which can be implied.
3. The disclosure is objected to because it should not refer to the claims, but does on pages 1 and 3-8 of the specification. Particularly, pages 5 and 6 refer to claims 6-9, which have been cancelled. Appropriate correction is required.

### ***Claim Objections***

4. Claim 36 is objected to because there is insufficient antecedent basis for "the first operating state" in line 2 of the claim. Appropriate correction is required.
5. Claim 36 is objected to because there is insufficient antecedent basis for "the first position" in line 5 of the claim. Appropriate correction is required.

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6. Claim 36 is objected to because there is insufficient antecedent basis for “the overcurrent” in lines 6-7 of the claim. Appropriate correction is required.
7. Claim 36 is objected to because there is insufficient antecedent basis for “the third operating state” in line 12 of the claim. Appropriate correction is required.
8. Claim 36 is objected to because there is insufficient antecedent basis for “the insulator” in lines 12-13 of the claim. Appropriate correction is required.
9. Claim 40 is objected to because there is insufficient antecedent basis for “the resistance element for achieving a gentle interruption characteristic” in line 2 of the claim. Appropriate correction is required.
10. Claim 41 is objected to because there is insufficient antecedent basis for “the electromagnetic force” in line 3 of the claim. Appropriate correction is required.
11. Claim 42 is objected to because “a)” appears twice. It appears that the first occurrence of “a)”, in line 2 of the claim, should be omitted. Appropriate correction is required.
12. Claim 42 is objected to because there is insufficient antecedent basis for “the arc ignition voltage” in line 5 of the claim. Appropriate correction is required.
13. Claim 42 is objected to because there is insufficient antecedent basis for “the intermediate electrodes” in line 6 of the claim. Appropriate correction is required.
14. Claim 44 is objected to because the meaning of subsection a), particularly “and in the first operating state with the stationary electrodes in the second operating state is electrically connected at least on one side to the resistance element and in the third operating state at least on one side is connected to the insulator” in lines 3-5, of the

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claim is unclear. It appears that inserting commas in the appropriate places and rewording subsection a) would help to clarify its meaning. Appropriate correction is required.

15. Claim 45 is objected to because the phrase in lines 10-11, "the operating current can be limited to the current which is to be limited," is unclear. Appropriate correction is required.

16. Claim 47 is objected to because there is insufficient antecedent basis for "the current supply" in line 2 of the claim. Appropriate correction is required.

17. Claim 48 is objected to because there is insufficient antecedent basis for "the magnetic field" in line 2 of the claim. Appropriate correction is required.

18. Claim 48 is objected to because there is insufficient antecedent basis for "the resistance means for arc-free current limitation" in line 5 of the claim. Appropriate correction is required.

19. Claim 49 is objected to because it appears that "(a)" should be changed to --a)-- in order to be consistent with the other claims. Appropriate correction is required.

20. Claim 49 is objected to because there is insufficient antecedent basis for "the magnetic field" in line 2 of the claim. Appropriate correction is required.

21. Claim 49 is objected to because there is insufficient antecedent basis for "the liquid aggregate state" in line 3 of the claim. Appropriate correction is required.

22. Claim 53 is objected to because there is insufficient antecedent basis for "the resistance element for achieving a gentle interruption characteristic" in line 2 of the claim. Appropriate correction is required.

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23. Claim 54 is objected to because "a)" appears twice. It appears that the first occurrence of "a)", in line 2 of the claim, should be omitted. Appropriate correction is required.

24. Claim 54 is objected to because there is insufficient antecedent basis for "the arc ignition voltage" in line 5 of the claim. Appropriate correction is required.

25. Claim 54 is objected to because there is insufficient antecedent basis for "the intermediate electrodes" in line 6 of the claim. Appropriate correction is required.

26. Claim 56 is objected to because there is insufficient antecedent basis for "the resistance means for arc-free current limitation" in line 5 of the claim. Appropriate correction is required.

27. Claim 57 is objected to because there is insufficient antecedent basis for "the magnetic field" in line 2 of the claim. Appropriate correction is required.

28. Claim 57 is objected to because there is insufficient antecedent basis for "the liquid aggregate state" in line 3 of the claim. Appropriate correction is required.

### ***Double Patenting***

29. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422

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F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

30. Claims 36-43 and 45-57 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-8, 12 and 13 of U.S. Patent No. 7,139,158. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims in the '158 patent disclose all the limitations of claims 36-43 and 45-57 in the present application. The solid electrodes, liquid metal, isolator, soft disconnection characteristic, autonomous activation, distance/time characteristic, current limiting gradient, network-dependent short circuit currents, and height extent of the '158 patent correspond to the stationary electrodes, movable electrode, insulator, gentle interruption characteristic, automatic activation, path-time characteristic, steepness of current limitation, line-induced short circuit currents, and vertical extension recited in the claims of the present application, respectively. The limitations recited in claim 46, including the Lorenz force, are inherent with regard to the magnetic fields in the claims of the '158 patent, as well as in the preceding claims in the present application.

***Claim Rejections - 35 USC § 102***

31. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

32. Claims 36-43 and 45-57 are rejected under 35 U.S.C. 102(b) as being anticipated by Niayesh et al. (WO 2005/006375).

Regarding claim 36, Niayesh teaches a process for current limiting with a current limiting device (1) which comprises stationary electrodes and at least one movable electrode (3), in a first operating state between the stationary electrodes an operating current being routed on a first current path through the current limiting device (1) and the first current path being routed at least partially through the movable electrode (3) which is in a first position, in a second operating state at least one movable electrode (3) being moved automatically by an electromagnetic interaction with an overcurrent which is to be limited along one direction of motion into at least one second position, the movable electrode (3) in a transition from the first position to the second position being guided along one resistance element (5) and in at least one second position being in series with the resistance element (5) and thus a current-limiting second current path (31) being formed by the current limiting device (1) which has a definable electrical resistance, characterized in that in a third operating state the movable electrode is in series with an insulator and thus an insulating clearance for circuit breaking by the



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device is formed. See abstract and Figs. 1a, 1b, 3, 4 and 6. Also see claims 1, 6 and 7 of corresponding U.S. Patent No. 7,139,158 for a description in English.

Regarding claim 37, Niayesh teaches that the third operating state is triggered by an interruption command by which an external magnetic field is reversed between operation of the device (1) as a current limiter and as a circuit breaker. See abstract and Figs. 1a, 1b, 3, 4 and 6. Also see claim 7 of corresponding U.S. Patent No. 7,139,158 for a description in English.

Regarding claim 38, Niayesh teaches that in the third operating state

a) the movable electrode (3) is moved along the opposite direction of motion into at least one third position and

b) in the at least one third position the movable electrode (3) is in series with the insulator.

See abstract and Figs. 1a, 1b, 3, 4 and 6. Also see claim 7 of corresponding U.S. Patent No. 7,139,158 for a description in English.

Regarding claim 39, Niayesh teaches that

a) the movable electrode (3) is automatically guided along the resistance element (5) to an extreme second position by the electromagnetic interaction with the overcurrent which is to be limited, and

b) the extreme second position lies in the area in which the resistance element (5) passes into an insulator so that the insulating clearance for current interruption is formed.

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See abstract and Figs. 1a, 1b, 3, 4 and 6. Also see claims 5 and 6 of corresponding U.S. Patent No. 7,139,158 for a description in English.

Regarding claim 40, Niayesh teaches that

a) a resistance element (5) for achieving a gentle interruption characteristic with an electrical resistance which rises nonlinearly along the direction of motion of the movable electrode (3) for the second current path (31) is chosen and/or

b) the resistance element is ohmic and the electrical resistance increases continuously with the second position.

See abstract and Figs. 1a, 1b, 3, 4 and 6. Also see claim 1 of corresponding U.S. Patent No. 7,139,158 for a description in English.

Regarding claim 41, Niayesh teaches that

a) the second operating state is automatically activated by the overcurrent by the currently-carrying movable electrode (3) being moved by an electromagnetic force which is perpendicular to the current through the movable electrode (3) and perpendicular to a magnetic field and which has one force component parallel to the direction of motion,

b) the magnetic field is chosen as an external magnetic field and/or as an internal magnetic field which is produced by a current fed to the current limiting device (1)

See abstract and Figs. 1a, 1b, 3, 4 and 6. Subsection a) describes the Right-Hand Rule. Also see claim 6 of corresponding U.S. Patent No. 7,139,158 for a description in English.

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Regarding claim 42, Niayesh teaches that the electrical resistance as a function of the second position and a path-time characteristic of the movable electrode (3) along the direction of motion are chosen such that

a) in every other position of the movable electrode (3) the product of the electrical resistance and the current is less than an arc ignition voltage between the movable electrode (3) and the stationary electrodes and optionally intermediate electrodes and/or

b) sufficient steepness of current limitation for controlling line-induced short circuit currents is achieved.

See abstract and Figs. 1a, 1b, 3, 4 and 6. Also see claim 2 of corresponding U.S. Patent No. 7,139,158 for a description in English.

Regarding claim 43, Niayesh teaches that

a) the movable electrode (3) comprises a liquid metal which is located in at least one channel (3a) of the current limiting device (1) and can be moved along the vertical extension of the channel (3a) between the first current path for the operating current, the second current path (31) for current limiting and the insulating clearance for current interruption and

b) especially wherein several channels (3a) are separated from one another by wall-like segments which in the area of the first current path have intermediate electrodes for transmitting the operating current, in the area of the second current path have individual resistances of the resistance element and in the area of the insulating clearance pass into segments for current insulation.

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See abstract and Figs. 1a, 1b, 3, 4 and 6. Also see claims 1, 3 and 4 of corresponding U.S. Patent No. 7,139,158 for a description in English.

Regarding claim 45, Niayesh teaches stationary electrodes and at least one movable electrode (3), in the first operating state between the stationary electrodes there being a first current path for the operating current and the first current path is routed at least partially through the movable electrode (3) which is in the first position, electromagnetic drive means being present for movement of the movable electrode (3) along one direction of motion into at least one second position, which movement is automatic in an overcurrent, electrical resistance means (5) with a definable electrical resistance being present and in the second operating state the movable electrode (3) being at least partially in series with the resistance means (5) and together with them forming a second current path (31) on which the operating current can be limited, wherein in the third operating state the movable electrode (3) is in series with the insulator and thus an insulating clearance for power interruption by the device (1) is present. See abstract and Figs. 1a, 1b, 3, 4 and 6. Also see claims 1 and 6-8 of corresponding U.S. Patent No. 7,139,158 for a description in English.

Regarding claim 46, Niayesh teaches that the electromagnetic drive means comprise magnetic field means for producing the magnetic field which exerts a Lorenz force with a force component parallel to the direction of motion on the movable electrode (3) through which the current has flown so that the movable electrode (3) can be moved between the first current path for the operating current, the second current path (31) for current limitation, and the insulating clearance for current interruption. See

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abstract and Figs. 1a, 1b, 3, 4 and 6. The limitations recited in claim 46, including the Lorenz force, are inherent with regard to the magnetic fields in the claims of the '158 patent, as well as in the preceding claims in the present application.

Regarding claim 47, Niayesh teaches that

a) the magnetic field means comprise a current supply to the current limiting device (1) in order to produce an internal magnetic field which is dependent on the overcurrent which is to be limited and/or

b) the magnetic field means comprise means for producing an external controllable magnetic field.

See abstract and Figs. 1a, 1b, 3, 4 and 6. Also see claim 6 of corresponding U.S. Patent No. 7,139,158 for a description in English.

Regarding claim 48, Niayesh teaches that

a) a magnetic field is designed according to an overcurrent which is to be limited and the path-time characteristics of the movable electrode (3) which is necessary for this purpose in the second current path (31) and/or

b) resistance means for arc-free current limitation have an electrical resistance which increases nonlinearly along the direction of motion up to an extreme second position for the second current path. See abstract and Figs. 1a, 1b, 3, 4 and 6. Also see the claims of corresponding U.S. Patent No. 7,139,158 for a description in English.

Regarding claim 49, Niayesh teaches that

a) the movable electrode (3) comprises a liquid metal which is moved by a magnetic field means in a liquid aggregate state. See abstract and Figs. 1a, 1b, 3, 4

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and 6. Also see the claims of corresponding U.S. Patent No. 7,139,158 for a description in English.

Regarding claim 50, Niayesh teaches that

a) the first current path for the operating current, the second current path (31) for current limitation and the insulating clearance are essentially perpendicular to the direction of motion and/or essentially parallel to one another and/or

b) at least one insulating clearance for current interruption is located above the second current path (31) and/or underneath the first current path.

See abstract and Figs. 1a, 1b, 3, 4 and 6. Also see claim 12 of corresponding U.S. Patent No. 7,139,158 for a description in English.

Regarding claim 51, Niayesh teaches an electrical switchgear assembly, especially high voltage or medium voltage switchgear assembly, comprising a device as claimed in claim 45. See abstract and Figs. 1a, 1b, 3, 4 and 6. Also see claim 13 of corresponding U.S. Patent No. 7,139,158 for a description in English.

Regarding claim 52, Niayesh teaches that

a) the movable electrode (3) is moved along the opposite direction of motion into at least one third position and

b) in the at least one third position the movable electrode (3) is in series with the insulator.

See abstract and Figs. 1a, 1b, 3, 4 and 6. Also see claim 7 of corresponding U.S. Patent No. 7,139,158 for a description in English.

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Regarding claims 53-57, the claims correspond to the above-rejected claims 40, 42, 43, 48 and 49, and are rejected under the same reasoning as that of the above claims. See above rejections.

***Claim Rejections - 35 USC § 103***

33. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

34. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Niayesh et al. (WO 2005/006375) in view of LaBrie (US 4,210,903).

Regarding claim 44, Niayesh teaches that the movable electrode (3) is in the first operating state with the stationary electrodes, in the second operating state is electrically connected at least on one side to the resistance element (5), and in the third operating state at least on one side is connected to the insulator. See abstract and Figs. 1a, 1b, 3, 4 and 6. Also see claims 1, 6 and 7 of corresponding U.S. Patent No. 7,139,158 for a description in English. The reference does not disclose that the movable electrode (3) comprises a solid-state conductor with at least one sliding contact, especially wherein the solid-state conductor is made essentially of lightweight metal and/or in a lightweight construction and/or the sliding contact is wetted with liquid metal for reducing friction; movable electrode (3) is a liquid metal conductor.

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However, LaBrie discloses a solid state conductor (22) with a movable electrode, wherein the solid-state conductor (22) is made essentially of lightweight metal and/or in a lightweight construction. See Fig. 3 and 4:22-25. It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the liquid metal of Niayesh with the solid state conductor of LaBrie in order to provide an equivalent electrical switching means for switching between different positions.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANN T. HOANG, whose telephone number is (571) 272-2724. The examiner can normally be reached on Monday-Thursday and every other Friday, 8 a.m. to 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard T. Elms, can be reached at (571) 272-1861. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ATH/  
3/27/09

/Stephen W Jackson/  
Primary Examiner, Art Unit 2836